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STANDARD OPERATING PROCEDURE
Mass Deposition Sampling Using Mass Deposition Sheets

KEY WORDS

Field sampling, mass deposition, mass deposition sheets

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Environmental Monitoring Branch organization and personnel, such as management, senior scientist, quality assurance officer, project leader, etc., are defined and discussed in SOP ADMN002.

1.0 INTRODUCTION

An important part of any pesticide application monitoring study is to know if the application was applied at the target rate. An effective way to determine the amount of active ingredient (ai) that has been applied to a given area is to set out, collect, and analyze mass deposition samples. Previous studies conducted by Environmental Monitoring have used the term Kimbies® for mass deposition samples, which were named after a material that is no longer available. Currently the branch is using Versi-Dry® lab soakers which are a plastic-backed paper towel manufactured by National Packaging Services Corporation. Mass Deposition Sheet (MDS) is the current term for any sheet like material that could be used to determine mass deposition. Examples of possible materials that could be used are aluminum foil sheets, cellulose sheets or glass fiber sheets. All materials selected for MDSs should be analyzed prior to field use by the laboratory to check for possible background interference on the lab instruments.

1.1 Purpose

This Standard Operating Procedure (SOP) discusses the general procedure for uniform collection of mass deposition samples on mass deposition sheets following a pesticide application. This SOP is most appropriate for applications of liquid formulations. Solid formulations will likely require a different procedure.

2.0 MATERIALS

2.1 Versi-Dry® lab soakers or other selected MDS (16” x 9”)
2.2 Corregated cardboard mount (18” x 18”)
2.3 Plastic bag (20” x 24”)
2.4 Cinder block
2.5 Bungie cord
2.6 Pushpins
2.7 Disposable gloves
2.9 Tyvek® bootie
2.10 Freez-safe® or ice chest
2.11 Dry ice
2.12 Aluminum foil sheet (12” x 20”) folded one time
2.13 Manila Envelope (letter size)
2.14 Chain of Custody (COC)
2.15 Large trash bag

2.16 Clear tape
2.17 Paper cutter

3.0 PROCEDURES

3.1 Preparation of Materials

3.1.1 While wearing disposable gloves, lab soaker towels should be cut into 16" x 9" (equivalent to 1ft^2) sheets using a paper cutter. The cut sheets should be stored together or individually in plastic bags. A larger or smaller sheet may be used depending on the design of the study, particularly the application rate. The size of the cardboard mount, plastic bag, and aluminum foil sheet may be adjusted accordingly.

3.1.2 Label manila envelopes with individual numbers based on instructions in SOP QAQC005.00

3.1.3 Fold a 12" x 12" aluminum foil sheet in half and insert into manila folder.

3.1.4 Fill out COC with the study number, sample number, chemicals to be analyzed and preparer's signature. Fold and insert the COC into the folder or staple to the front of the folder.

3.1.5 If pushpins have been previously used, they need to be cleaned prior to reuse. Clean by shaking them in a jar filled half-way with methanol or isopropyl alcohol, repeat, and dry.

3.1.6 Prepare cardboard mounts by placing two cardboard pieces on top of one another with corrugations perpendicular. Put the two pieces in one 20" x 24" plastic bag with opening taped closed.

3.2 Site Selection

3.2.1 Sites should be chosen within the treatment area at an appropriate frequency determined by the study director and be distributed to represent the entire area. For small treatment plots, staff may take very few samples; whereas for aerial applications, many MDS samples may be distributed and analyzed.

3.2.2 Sites should be secure with 24-hour access and protected from pets and children, and sprinklers. Sites should not be located near

the boundary of the treatment area and sampling media should be located away from any vertical objects at a distance equal to 2x the vertical height.

3.3 Aerial Pre-application MDS Sampling Site Set-up

3.3.1 Put on a new pair of disposable gloves.

3.3.2 Secure plastic covered cardboard mount to the top of a cinder block using a bungee cord strung through center hole of the cinder block and hooked onto the side edges of the cardboard mount.

3.3.3 Attach MDS to cardboard, if using Versi-Dry® lab soakers, place it towel side up, with 4 pushpins positioned at the corners of the MDS. A second board and MDS may be used as a backup sample.

3.3.4 Fill out COC with placement information. Ensure COC and manila envelope remain free from contamination.

3.4 Procedures after Aerial Application

3.4.1 Collect MDS at least 30 minutes after pesticide impact and when aircraft is well beyond sample location.

3.4.2 Use a new pair of disposable gloves and Tyvek booties at each location. Avoid touching any contaminated surfaces, such as fences or the outside of vehicles.

3.4.3 Using the pushpins to touch the MDS, fold several times (towel side folded in on first fold) being sure not to move the MDS from its original position on the cardboard and place into the opened aluminum foil sheet. Avoid touching the paper side of the MDS or the exposed surface of the cardboard while handling the sample.

3.4.4 Fold foil sheet in half with MDS totally covered and double crimp the three open edges of the foil and place into the numbered manila envelope selected for the site.

3.4.5 Place manila envelope into Freez-safe® or ice chest with dry ice.

3.4.6 Fill out COC with the appropriate information according to SOP ADMN006.00.

3.4.7 Remove plastic from cardboard mount and discard plastic into trash bag.

3.4.8 Cinder blocks, cardboard mount, and pushpins may be loaded into the vehicle at this time or remain at the site for later pickup.

3.4.9 Remove contaminated gloves and booties and place into a plastic trash bag prior to entering the vehicle.

3.5 Procedures for a Small Treatment or Ground Application

Due to the variability in applications and sites the study director should determine how to place MDS. For example, MDS have been placed vertically on masts at various heights during previous studies.

4.0 SAFETY

Some sampling may occur at night so vehicles should be stocked with the appropriate equipment, such as flashlights or headlamps. See the Field Health and Safety Program Guide (1998) for suggestions for working around pesticide applications and working at night.

Entering treated areas prior to the expiration of the restricted entry interval (REI) requires personal protective equipment described on the pesticide label or in regulation. Consult with the field safety officer prior to the study if a treated area must be entered prior to the expiration of the REI.

5.0 STUDY SPECIFIC DECISIONS

5.1 Size of MDS
5.2 Number and location of sampling sites
5.3 Time samples are collected after application
5.4 Safety procedures
5.5 Storage container or wrap for MDS (i.e. glass jars, foil, etc.)
5.6 Laboratory and project director need to decide on procedure for extracting storage container or wrap.

6.0 REFERENCES

California Department of Pesticide Regulation. 1998. Injury and Ilness Prevention Program. Field Health and Safety Program Guide.
http://reggie/docs/dprdocs/docsmenu.htm